

REMARKS

In view of the following remarks, Applicant respectfully requests reconsideration and allowance of the subject application. This amendment is believed to be fully responsive to all issues raised in the October 19, 2004

- 5 Office Action. As stated above, claims 1 and 10 are currently amended and claims 1-3, 6-10, 12, 13, 18 and 19 are pending.

Problems Addressed by the Elected Species

- 10 As stated in the last response, the instant application addresses causes of heat exchanger failure. For example, the Background section states, at page 3, lines 12-20:

15 Differential thermal expansion between elements of the heat exchanger 5 will cause a compression load to be applied to the quicker expanding sections (e.g. the core 20 and specifically the stack 26). As noted, a compression load is also applied to the stack 26 by the application of a pre-load. Compressive forces from pre-loading and differential thermal expansion can cause a variety of problems, such as buckling, fatigue failures and creep. Buckling is particularly problematic as it results in the stack 26 expanding outward (laterally) in one or more directions. During this outward expansion the plates 22 separate from one another, resulting in a nearly complete destruction of the heat exchanger.

- 25 The pending, elected claims are directed to thermally deformable tie rods that can reduce thermally induced buckling, fatigue failure and creep in heat exchangers. As recited in claims 1 and 10, at least a portion of a tie rod is in a flow path for fluid in communication with a core. In claim 10, the fluid is exhaust. For various reasons that follow, Applicant submits that none of the

cited references disclose, teach or suggest the subject matter of the pending, elected claims.

In particular, the Kodumudi reference (USPN 6,328,098) and the Kokubunji reference (USPN 6,705,387) pertain to radiators where mounting
5 structures for a radiator's core are in contact with ambient air, which tends to vary little in temperature in comparison to the hot fluid in the core. As such, Applicant submits that these structures do not thermally deform in relationship to the ambient air temperature for the purpose of accommodating variations in the size of a radiator's core.

10 Applicant submits that during operation, ambient air would cause the support structures to contract while a hot fluid in the radiator's core would cause the radiator's core to expand; thus, the structures of the Kodumudi and Kokubunji references would contract while the radiator's core expands, i.e., they would not accommodate operational variations in the size of the radiator's core.

15 In contrast, for example, consider claim 10 of the instant application, where exhaust may cause the core to expand and the tie rod to expand (as it is in a flow path for exhaust) to thereby accommodate the thermal expansion of the core.

20 Rejections Under 35 U.S.C. §102(e)

In the Office Action mailed October 19, 2004, the Office rejected claims 1-3, and 6-10 under 35 U.S.C. §102(b) as being anticipated by Kodumudi et al.

(USPN 6,328,098, the Kodumudi reference). Claims 2-3 and 6-9 depend on claim 1.

Claims 1-3 and 6-9

Claim 1, as currently amended, recites:

- 5 A heat exchanger comprising:
- a. a core having a thermally variable size; and
 - b. a support structure connected to the core, wherein
- the support structure comprises a tie rod having a planar section, positioned intermediate and amid a first end and a second end of the tie rod and in a flow
- 10 path for fluid in thermal communication with the core, that thermally deforms in
relationship to the temperature of the fluid to accommodate operational
variations in the size of the core.

Applicant submits that the Kodumudi reference does not (i) include every

15 element of claim 1; (ii) recite the elements as set forth in claim 1; (iii) teach the subject matter of claim 1; and (iv) enable the invention as recited in claim 1. In particular, the Kodumudi reference does not disclose structures that would accommodate operational variations in the size of the core in response to fluid in which they are in communication. Applicant respectfully submits that the

20 rejection under 102(e) is traversed and that claims 1-3 and 6-9 are allowable.

Claim 10

Claim 10, as currently amended, recites in part:

iii. a tie rod having a planar section, positioned intermediate and amid a first end and a second end of the tie rod and in a flow path for exhaust in thermal communication with the core, mounted between the first strongback and the second strongback and capable of applying a compressive load to the strongbacks even upon normal operational thermal deformation of the tie rod.

Applicant submits that the Kodumudi reference does not disclose a tie rod having a planar section positioned intermediate and amid a first end and a second end of the tie rod and in flow path for exhaust. Applicant respectfully submits that the rejection under 102(e) is traversed and that claim 10 is allowable.

Rejections Under 35 U.S.C. §102(b)

In the Office Action mailed October 19, 2004, the Office rejected claims 10 and 12 under 35 U.S.C. §102(b) as being anticipated by to Jackocks et al. (USPN 1,855,552, the Jackocks reference).

Claim 10, as currently amended, recites in part:

iii. a tie rod having a planar section, positioned intermediate and amid a first end and a second end of the tie rod and in a flow path for exhaust in thermal communication with the core, mounted between the first strongback and the second strongback and capable of applying a compressive load to the strongbacks even upon normal operational thermal deformation of the tie rod.

Applicant respectfully reiterates that the Jackocks references does not disclose a tie rod having a planar section positioned intermediate and amid a first end and a second end of the tie rod. Therefore, Applicant believes the rejection to be inappropriate and claim 10 to be allowable. Claim 12 depends on claim 10 and Applicant submits that claim 12 is also allowable.

Rejections Under 35 U.S.C. §103(a): Jackocks and Korczynski

In the Office Action mailed October 19, 2004, the Office rejected claims 13, 18 and 19 under 35 U.S.C. §103(a) as being unpatentable over Jackocks et al. (USPN 1,855,552, the Jackocks reference), in view of Korczynski et al. (USPN 5,323,849, the Korczynski reference).

Claims 13, 18 and 19 depend on claim 10. For at least the foregoing reasons, Applicant submits that claims 13, 18 and 19 are allowable. In particular, Applicant respectfully reiterates that the Jackocks references does not disclose a tie rod having a planar section positioned intermediate and amid a first end and a second end of the tie rod. Therefore, Applicant believes the rejection to be inappropriate and claims 13, 18 and 19 to be allowable.

Rejections Under 35 U.S.C. §103(a)

In the Office Action mailed October 19, 2004, the Office rejected claims 1-3, 6-10, 12, 13 and 18-19 under 35 U.S.C. §103(a) as being unpatentable over Kokubunji et al. (USPN 6,705,387), the Kokubunji reference.

The Kokubunji reference has a publication date of May 16, 2002. The instant application has a filing date of February 5, 2002, which is prior to May 16, 2002. Applicant submits that §103(a) does not apply. Further, the Office refers to Ikeda, Applicant does not understand what is Ikeda.

5 Regardless of these issues, Applicant submits that for the foregoing reasons, claims 1-3, 6-10, 12, 13 and 18-19 are allowable. In particular, Applicant refers the Office to the above discussion of radiators disclosed by the Kodumudi and Kokubunji references. The subject matter of claims 1 and 10 does not pertain to conventional automobile radiators.

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Conclusion

Pending claims 1-3, 6-10, 12, 13, 18 and 19 are believed to be in condition for allowance. Applicant respectfully requests reconsideration and prompt issuance of the present application. Should any issue remain that
15 prevents immediate issuance of the application, the Examiner is encouraged to contact the undersigned attorney to discuss the unresolved issue.

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Respectfully Submitted,

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Dated: 2/14/08

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